ABSTRACT

In general, in a first aspect, the invention features a method for determining the location of an alignment mark on a stage, which includes directing a measurement beam along a path between an interferometer and a mirror, wherein at least the interferometer or the mirror is mounted on the stage, combining the measurement beam with another beam to produce an output beam comprising information about the location of the stage, measuring from the output beam a location, x_1, of the stage along a first measurement axis, measuring a location, x_2, of the stage along a second measurement axis substantially parallel to the first measurement axis, calculating a correction term, ψ_3, from predetermined information characterizing surface variations of the mirror for different spatial frequencies, wherein contributions to the correction term from different spatial frequencies are weighted differently, and determining a location of the alignment mark along a third axis parallel to the first measurement axis based on x_1, x_2, and the correction term.